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SOVIET STANDARDS FOR METALLURGICAL PRODUCTION

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The characteristics of the products of the metallurgical and all the other industries in the Soviet Union are established by standards. The standards consist of the indicators ГОСТ (GOST, State All-Union Standard) followed by a group of figures and occasionally a letter of the alphabet. Prior to 1940, the initial letters of the standard were ОСТ (OST, All-Union Standard). Eventually all ОСТ standards will be replaced by ГОСТ .

The figures following this letter-group are the numbers of the standard and the year in which they were issued. For example, GOST 380-50, for normal carbon steels, and GOST-V 1050-41 were issued in 1950 and 1941, respectively. The В (V) in the second standard indicates that it was issued during World War II.

The standards for iron, steel, and other metals usually include specifications for their chemical composition and mechanical properties.

For chemical composition, Soviet standards distinguish between more than 500 types of iron and steel, from Armco iron to the high-alloy special steels, as well as a large number of types (marks) of nonferrous metals and alloys. GOST 380-50, for normal carbon steels, includes the Group A steels, those with fixed mechanical properties, and Group B steels, with fixed chemical properties. To Group A belong the steels ST 0 to ST 7 (Russian "СТ" steel) with a progressive tensile strength of from 32 to > 80 kilograms per square millimeter. For Group B the manufacturing process is taken into consideration; here a distinction is made between the marks МСТ (Siemens-steel) 0 to 7 and БСТ (BST, Bessemer steel) 0 and 3 to 7. Thomas steel is not included in GOST 380-50.

GOST-V-1050-41 makes no distinction according to chemical composition between steel with normal manganese content and steel with increased manganese content.

The steels are designated by a two-figure number and, in Group II, also by the letter Г (G). The two-figure number represents the average carbon content in percent (for example, 0.27 to 0.35 is indicated by 30) and the letter Г shows that it pertains to a steel with increased manganese content.

The letters КП (KP) are used to indicate flange steel, and the letters ПС (PS), semiflange steel.

The consumer may request that the steels indicated by GOST-V-1050-41 be produced with a guaranteed weldability and with a fixed grain size with a specified heat-treatment.

The consumer may also request the impact test for quality steels 30, 35, 40, 45, 50, and 50Г. The impact test is indicated by the letter У (U), for example, 30 У , 50 ГУ.

In GOST-V-1050-41, for every quality of steel, the values for tensile strength, yield point, elongation, shrinkage, and, if necessary, the Brinell hardness as received are specified in the order of application.

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GOST 4543-48 pertains to construction steels. This GOST specifies both the chemical composition and the mechanical properties of the steel.

Quality steels with a low sulfur and phosphorus content and high mechanical properties are designated by the letter A at the end of the steel designation.

For the steel designations of Soviet standards, the alloy elements of the steel are indicated by Cyrillic letters, as follows:

Manganese	Г	(G)	Vanadium	Ф	(F)
Silicon	С	(S)	Molybdenum	М	(M)
Chromium	Х	(Kh)	Aluminum	Ю	(Yu)
Nickel	Н	(N)	Titanium	Т	(T)
Tungsten	В	(V)			

The numbers after the letters represent the percentage content in the steel of the particular alloy elements, rounded off to the nearest whole number. The following is an example:

18Х2Н4МА, Chromium-Nickel-Molybdenum Steel

18 -- 0.15-0.22 percent carbon

Х2 -- 1.45-1.75 percent chromium

Н4 -- 3.25-3.75 percent nickel

М -- 0.20-0.30 percent molybdenum

А -- Indicator for high-quality steel with a maximum of 0.035 percent phosphorus and a maximum of 0.030 percent sulfur.

In addition, several other letters serve as steel designators. The letter А at the beginning of a steel designator, such as А12 and А15, indicates free-cutting steel, GOST-V-1414-42. The letter Ш (Sh) stands for ball-bearing steel, GOST 801-47; the letter У (U) for unalloyed tool steel (У7 to У13 with a carbon content from 0.60 to 1.40 percent); Р (R) for high-speed steels, for example, Р18 with 18 percent tungsten and Р9 with 9 percent tungsten. Cast iron, GOST 1412-48, is designated by the letters СЧ (SCh), and modified cast iron by the letters МСЧ (MSCh). Of the two numbers following СЧ , for example, СЧ 18-36, the first indicates the tensile strength, the second the bending strength. Wear-resistant cast iron for bearings according to GOST 1585-42 is СЧШ (SChSh), and malleable cast iron according to GOST 1215-41 has the designation КЧ (KCh). Soviet standards include a large number of special rolled sections, such as are used for agricultural machinery, locomotives, tenders, railroad cars, etc.

The Soviet standards for rolling-mill products describe various grades of size and weight limitations, such as normal allowances and high and extreme accuracy. For thin metal plate there are, for example, three different thickness variations.

Great significance is attached to the elongation exactness of round bar steel and tubing and to the smoothness of sheet metal as well as the surface finish of rolling-mill products. In all cases, an effort is made to achieve by means of Soviet standards a high-quality product.

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